

## Field Releases of the Decapitating Fly, *Pseudacteon tricuspidis*

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Phorid flies in the genus *Pseudacteon* are a promising group for biological control of fire ants. Maggots of these miniature flies develop in the heads of fire ant workers, decapitating their host upon pupation. Fire ant workers are keenly aware of the presence of phorid flies. The presence of a single fly usually stops or greatly inhibits the foraging efforts of hundreds of workers in only a minute or two.

The overall impact of these flies on fire ant populations is still unknown; however, it is clearly sufficient to have caused the evolution of a number of phorid-specific defense behaviors. These behaviors could only have evolved if *Pseudacteon* flies had population-level impacts on the survival of fire ant colonies or the production of sexuals.

Our rearing techniques have gradually improved over the past year. Our laboratory is currently producing 800-1800 *P. tricuspidis* flies/day and 100-300 *P. curvatus* flies/day. We are cooperating with the ARS laboratory in Starkville, MS to develop ways of further automating the process and improving production efficiency. We are particularly positive about our abilities to rear *P. curvatus*. Once we are able to get this species out of quarantine, we should be able to rear twice as many flies as *P. tricuspidis* with half the effort. Having a steady supply of flies has been the key to our current success in releasing *P. tricuspidis*.

Permits to release *P. tricuspidis* were granted to our lab in 1997. Three releases were conducted in the summer and fall of 1997. Flies have been recovered from one of these sites every month since October 1997, a period of more than 18 months. During this period the flies survived two winters, a flood, and a severe summer drought. Fly populations at this release site still appear to be increasing as evidenced by the numbers of flies observed and the percent of mounds attacked during these observations. These densities are already comparable to those found in South America. It will be very interesting to see if populations continue to grow in the coming year. The growth and persistence of flies at this site is very important because it proves that *P. tricuspidis* can establish self-sustaining and apparently permanent populations on the red

imported fire ant in the United States.  
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summer and fall of 1998, flies were released at six additional sites qtr , Florida (3), Alabama (1), Arkansas (1) and Oklahoma (1). Field-reared flies have been consistently recovered from all three of the Florida sites for the last 5-7 months. Field-reared flies were also recovered from the Arkansas site for two weeks before cold weather set in. Because of the onset of winter, we do not expect to recover flies from the remaining sites until spring 1999. We are currently monitoring fire ant populations at the release sites and paired control sites. We will begin assessing the impacts of phorid flies on fire ant populations in the next year or two after the fly populations have a chance to build up. We will also monitor rates of fly dispersal from the release sites. This information will allow us to determine the value of these flies as fire ant biocontrol agents and how many release sites we will need in each state to achieve maximum benefits in a predetermined amount of time.

Successful releases of these flies and other natural enemies will not eradicate imported fire ants, but they could help tilt the ecological balance in favor of our native ants. If this happens, fire ant populations in the United States could be reduced to levels similar to those in South America.

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